

1999 MODEL YEAR NAVIGATION SYSTEMS

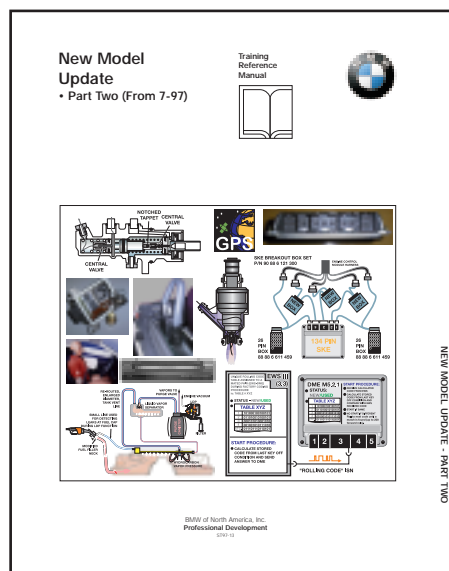
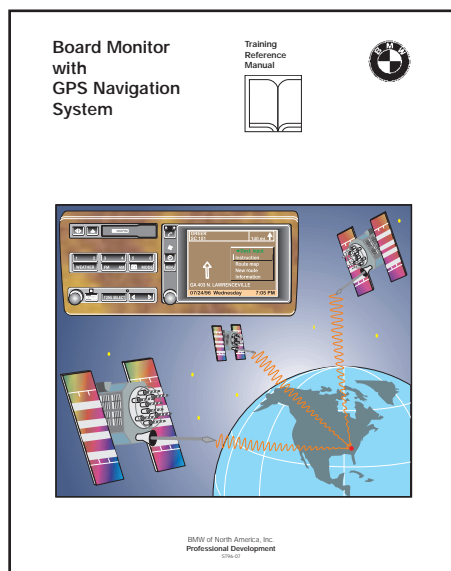
OVERVIEW

The 1999 Model Year has expanded Navigation System availability for all BMW vehicles. The E38/E39 systems are primarily carry over from previous systems with software improvements.

Currently there is one Navigation system available for the E46 which is based on the familiar Mark II original equipment system. In the future there will be three additional systems (refer to chart on next page).







For background information on previous model year Mark II, Mark III and E36 Accessory Navigation Systems refer to:

- On-Board Monitor with GPS Navigation System
- 1998 New Model Update (titled 1997 Part 2).



This section will cover the changes that occurred to the systems where different for the E46 Mark II system. The release of future systems (E46 Radio Navigation and E46 Mark III accessory system and E46 Mark III monochrome accessory system) will be addressed when released.

1999 Model Year Navigation Systems

	E38 - E39	E36 - roadster	E46
Original Equipment Systems	<p>Mark II Board Monitor System Same System as 1998 Model Year with software improvements (Refer to 1998 New Model Update Book)</p> 	<p>None Available</p>	<p>Mark II Board Monitor System Same as E38/E39 Mark II with E46 specific Board Monitor. Availability: 10/98</p> 
			<p>Mark II Radio Navigation System Monochrome Text display (no maps) and Audio Navigation System based on Mark II. Display unit integrated into radio. Availability: Future</p> 
Accessory Navigation Systems	<p>Mark Ili BMW center installation. Same as 1998 Model Year System. Goose neck mounted display. (Refer to 1998 New Model Update Book)</p>  <p>Refer to SI 84 01 99 for installation instruction modifications to 1999 E38/E39 vehicles. (except sport wagon)</p>	<p>E36 Accessory Navigation System BMW center installation. System manufactured by Siemens. Same as 1998 system. (Refer to 1998 New Model Update</p> 	<p>Mark Ili BMW center installation. System based on E38/E39 Mark Ili with exception of display mounting location. Availability: Future</p>
			<p>E46 Monochrome Accessory Navigation System BMW center installation. Monochrome Text display (no maps) and Audio Navigation System based on Mark Ili. Separate display unit with rotary push button installed in lower center console. Availability: Future Refer to installation instruction set.</p> 

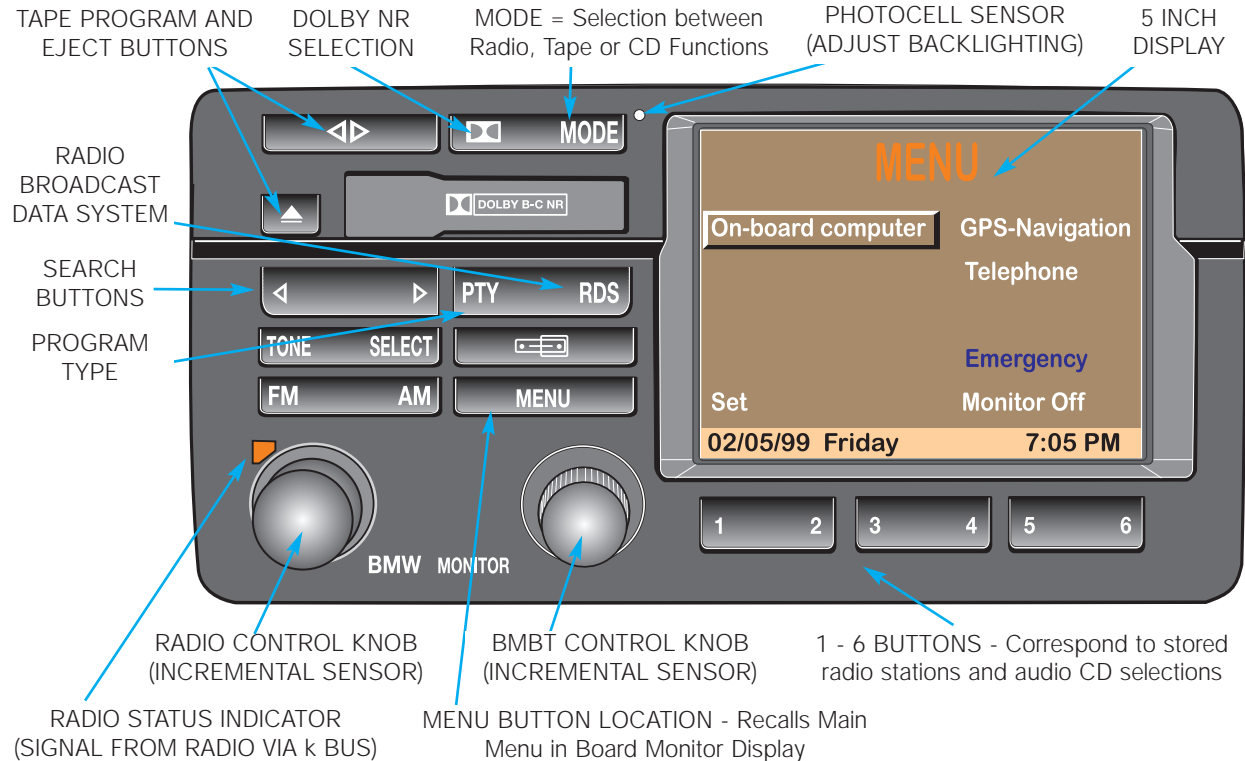
E46 MARK II NAVIGATION SYSTEM

COMPONENT OVERVIEW

The E46 Mark II Navigation System is similar to E38/E39 Mark II. All of the E38/E39 Mark II system components are carried over with the exception of the BMBT:

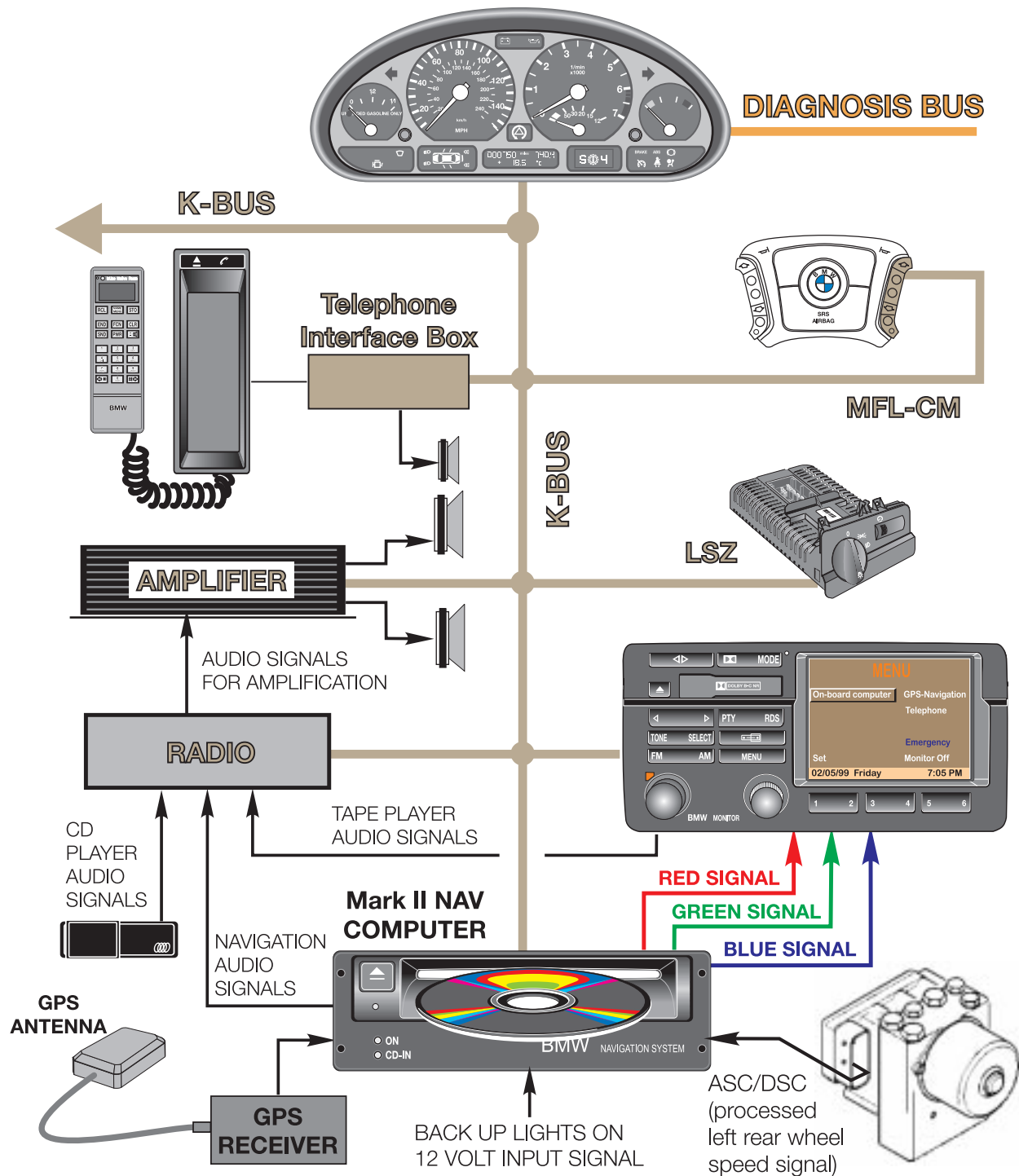
E46 Specific Board Monitor (BMBT):

- 5 inch display (320 X 234 pixel resolution)
- Uses on screen soft keys for telephone send/end functions. E38/E39 uses buttons.
- Does not include auxiliary ventilation function (not a function of E46 BC/IHKA).
- Provides display and control functions for the Audio System (radio, cassette and CD).
- Provides display and control functions for systems in the menu display.



1999 MODEL YEAR RADIO CHANGES

- The 1999 model year radios do not have the weatherband feature.
- **RDS** = Radio Broadcast Data System. In the future, this button will put the vehicle occupants in touch with a wide variety of broadcast data including weather information.
- **PTY** = Any unit having RDS will also have a separate button for the PTY feature. It stands for Program Type and will indicate the type of music being played. This is helpful for organizing favorite station programming. Both RDS and PTY features require the cooperative input of the various radio stations.



The BMBT communicates with interfacing control modules via the K Bus. As with all previous Original Equipment Navigation Systems, the radio electronics are installed in the trunk. The BMBT sends and receives operation instructions to the radio via bus communication. The Mark II Nav computer continues to provide the RGB output signals to the BMBT for system function display.

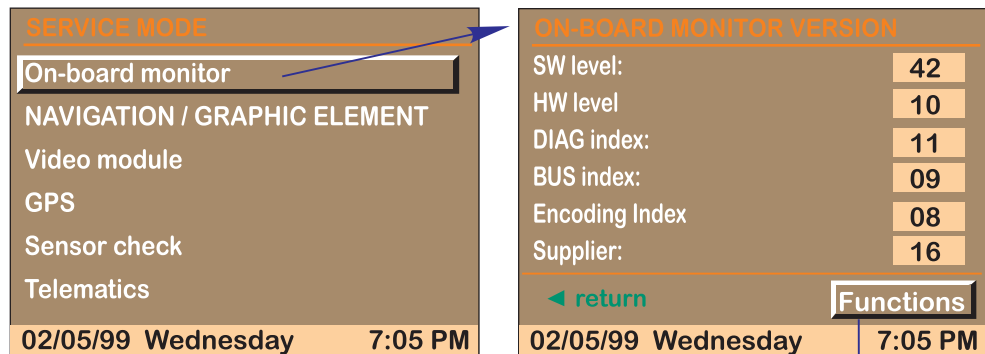
E46 BOARD MONITOR & NAVIGATION SERVICE MODE DISPLAYS

The Mark II system provides a service mode display function. These screens provide system hardware/software identification numbers and status of Board Monitor and Navigation specific functions for use as a diagnostic tool. The screens are accessed as follows:

- From the Main Menu select "Set".
- Once in the Set function, press and hold the menu button for 8 seconds.
- The next screen to appear is the SERVICE MODE menu.

The first accessible function is "On-board monitor". Pressing this selection calls up the version screen which provides identification of hardware/software specific index versions for the installed system.

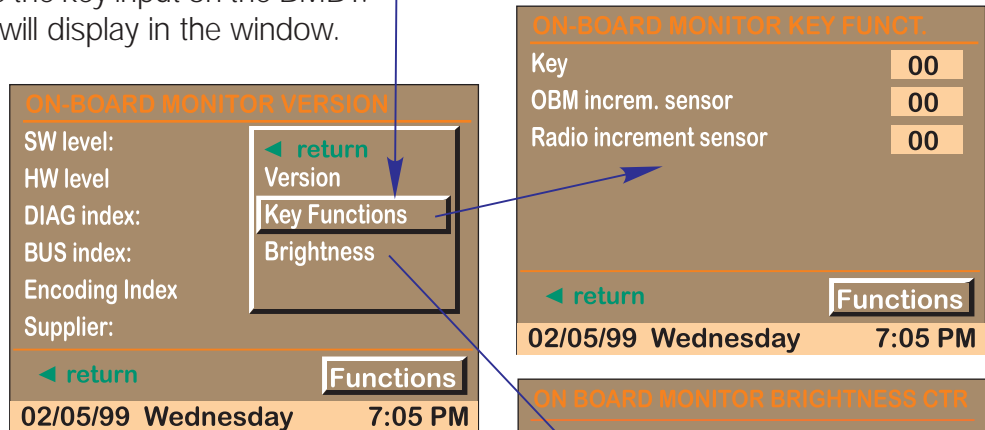
Pressing the functions key at the bottom continues into additional screens including the Key Functions and Brightness controls.



Key Functions tests the key input on the BMBT. Input status (1-25) will display in the window.

If no keys are pressed the status will be displayed as "FF".

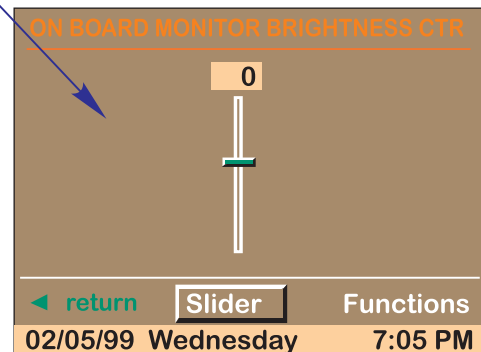
Rotating the left or right rotary knob displays hex code input status.



Rotated slowly, the display changes with each increment. The display eventually stops at "1F" in the left rotated direction and "E0" to the right.

The key function test terminates automatically if no keys or knobs are moved after a short duration ("00").

The brightness control allows the display illumination to be manually adjusted.



The next accessible function is the NAVI/GRAPHIC ELEMENT.

This screen identifies hardware/software specific index versions for the installed system.

SERVICE MODE

- On-board monitor
- NAVI/GRAPHIC ELEMENT**
- Video module
- GPS
- Sensor check
- Telematics

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NAVI/GRAPHIC ELEMENT

- SW level: 04
- HW level: 10
- DIAG index: 02
- BUS index: 08
- Encoding Index: 01
- Supplier: 0103708.21

return

02/05/99 Wednesday 7:05 PM

The Video module selection is not functional since the US version Mark II nav system does not utilize the video module.

The next available selection from the service mode menu is "GPS".

This display provides the GPS receiver module hardware version number and date of programmed software.

SERVICE MODE

- On-board monitor
- NAVI/GRAPHIC ELEMENT
- Video module
- GPS**
- Sensor check
- Telematics

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GPS VERSION

- Receiver Version: 7.51
- Receiver SW Date: 10.1.99

return Functions

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Pressing the functions button in the lower right corner of this screen provides a sub-selection menu.

GPS Status provides information on the exact coordinates of the vehicle based on the calculations of the GPS receiver module.

GPS VERSION

- Receiver Version
- Receiver SW Date:

- return
- GPS Version
- GPS status**
- GPS tracking info

return Functions

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GPS STATUS

- Latitude: 33' 44' 12"
- Longitude: 123' 22' 33"
- Altitude: 0 m
- Date/time (UTC): 00.00.97 15:56
- G-speed/heading: 0.0 m/s 000
- Rec-Stat/Pos-Src: SEARCH 0
- PDOP/HDOP/VDOP: 0.0 0.0 0.0

return Functions

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GPS Tracking provides information about the individual satellites currently sending signals to the GPS receiver module. Though interesting, this display provides data which is not usable for BMW service technician scope of diagnosis.

GPS TRACKING INFO

Ch	PRN	S/N	Ch	PRN	S/N
1	---	-. -	5	---	-. -
2	---	-. -	6	---	-. -
3	---	-. -	7	---	-. -
4	---	-. -	8	---	-. -

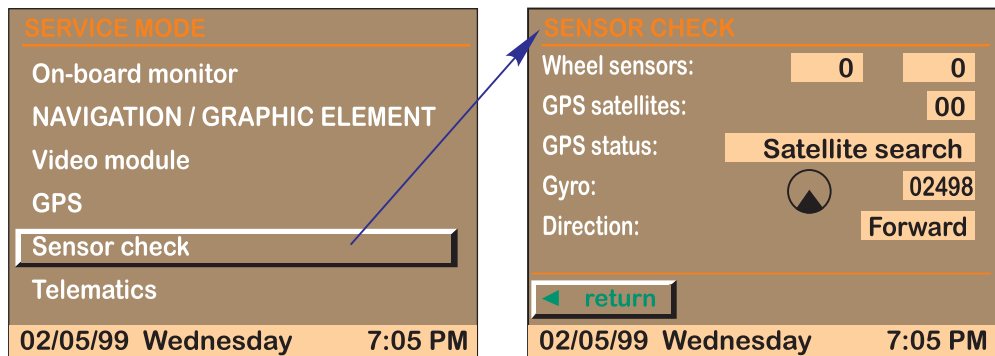
Visible Satellites: 08
Almanac: no

return Functions

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The next selection available from the SERVICE MODE menu is "Sensor check" which provides:

- Wheel speed input (only one wheel speed signal, displayed).
- Number of satellites detected.



- What mode the GPS receiver module is currently in; (ie: Search)
- The Gyro status provides the millivoltage value the Nav computer is utilizing for the current vehicle position. This area also includes an icon representing what direction the vehicle is heading in.
- The direction status indicates what gear is selected (forward or reverse).

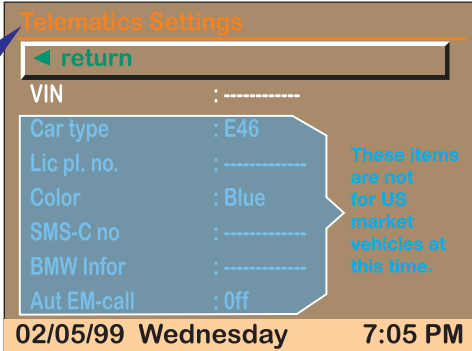
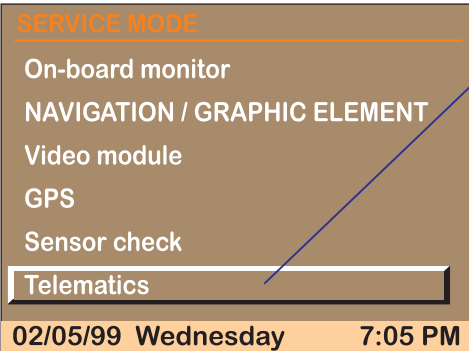
The Sensor check display is intended to be used while test driving the vehicle. Use the legend below to compare with the display status.

		signal input.
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possible.

The last selection available is the **Telematics** entry display. This replaces the "VIN" selection from the E38/E39 Mark II systems. The only requirement of this entry screen is that the VIN is entered at the VPC when prepped prior to distribution.

This is necessary for the Emergency program if needed when calling the Cross Country Group Roadside Assistance Program.



Additionally, if the vehicle is equipped with a Phase V phone the system will automatically utilize the entered VIN as per E38/E39 Mark II systems.

The VIN is entered at the VPC for all vehicles (with or without a Phase V phone). If the VIN has been incorrectly entered it can be changed by turning and pressing the rotary knob when the correct letter or digit of the last seven character of the VIN is displayed.

The balance of the data displayed below the VIN entry is not currently used in the US market.



1999 NAVIGATION SYSTEM SOFTWARE 0.9

(EXCLUDING E36 Accessory Navigation System)

Software version 0.9 is required for the Mark II system. Loading procedures are unchanged for the Mark II system, refer to the original On-board Monitor with GPS Navigation system handout or SI 84 01 97 for detailed procedures.

The following enhancements have been introduced with Software Version 0.9, **This update will be appropriate for installation in all navigation system equipped vehicles produced after September 1, 1997.**

- A "Route list" is available within the "Information" screen of "GPS-Navigation", displaying the planned routes cities, streets, & distance segments. The route list will be updated during a trip.
- The "Route Direction Arrow" (RDA) will dynamically point the way around turns in partly digitized (intertown) areas when "Guidance" is active. This safety feature helps ensure the driver stays on the planned route and doesn't deviate onto roads that are not digitized. This feature is especially helpful on unknown roads at night, in fog, and/or rain.
- The "Map" will be continuously updated in the background, reducing map display time when switching from "Guidance" to "Map" mode. This feature will be stopped during destination input and route planning to reduce microprocessor calculation time for these activities.
- The default scale for the "Map" which appears when leaving digitized roads will be reduced from 1/2 mile to 1/4 mile. More features of the local area are displayed at this scale. All other maps will be displayed in the same scale as last selected by the user after a restart of the vehicle.
- In the "Destination Input" menu, intersections will now be enterable by the "intelligent keyboard" if the number of possible options exceed five. This will speed up the procedure compared to the previous selection from "List" procedure.
- In "Map" mode, a new menu item, "Repeat" will become available. Pushing this default soft key will prompt the system to repeat the last audible instruction, like pushing the same soft key in the "Guidance" (pictogram) mode.
- The audible instructions can be turned off completely if the driver chooses by holding the soft key "Repeat" down for at least 1 second. After restart of the vehicle, or, by pushing the "Repeat" soft key again, the audible instructions are restored.

Audible instruction status is displayed next to the "Repeat" soft key by way of a speaker symbol, with or without a line through it.

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- The current car position (CCP) icon in the "Map" display is doubled in size & doesn't blink.
 - The last ten destinations entered are automatically stored in & are retrievable from the "Address book", under the sub-heading "Last destination". These addresses, as well as those in the normal Address book, can be deleted in one operation, by holding down the "Delete" soft key for more than one second. The user is asked to confirm this operation to prevent inadvertent erasure.
 - Guidance improvements include more frequent usage of the audible command, "Follow the main road" and dynamic re-planning & presentation of advice if the driver deviates from the planned route while driving around a traffic circle or rotary.
 - On E46 Mark II systems, the distance-to-junction (execution of next instruction) is displayed in the board computer display of the instrument cluster. The "distance" display instruction begins at 800' to the junction.

Service/system diagnosis mode enhancements:

- After a software CD is inserted the display "SW-CD inserted" will appear. A few seconds later, this display is followed by a system reset & then the software loading starts.

MARK II NAVIGATION SYSTEM CALIBRATION

The calibration procedure of the Mark I system is not required with the Mark II system. This system self calibrates automatically as the vehicle is driven after following the steps below.

- System must be fully functional with no faults present in fault memory.
- Correct Map data base CD installed for your .
- Vehicle outside with an unobstructed overhead view. Switch ignition on and allow system adequate time to receive a minimum of three GPS signals. This is confirmed by the green GPS indicator in the map display.
- Set the map display to the 400' scale and drive the vehicle on digitized roads. Make frequent turns at intersections where possible.

While driving, the system utilizes the map CD, the received GPS coordinates, the Gyro sensor to determine turn activity and the wheel speed sensor input. It compares all of these variables and automatically pinpoints the vehicle position.

MARK II NAVIGATION SYSTEM DIAGNOSIS

The Nav computer does not communicate with the DIS/MoDiC. Diagnosis of the Nav Computer is performed with conventional procedures and by utilizing the Status displays on the previous pages.

Refer to the DIS for RGB output signal oscilloscope displays for visual confirmation of signal integrity.

The Board monitor (BMBT) does however communicate with the DIS/MoDiC. Follow the fault symptom path of the DIS Diagnosis Program for detailed diagnostic procedures.

